

WHAT WE CLAIM ARE:

1. A semiconductor device comprising:
 - a semiconductor element formed over a surface of a semiconductor substrate;
 - 5 a first insulating film formed over the surface of the semiconductor substrate, the first insulating film covering the semiconductor element;
 - a second insulating film formed over the first insulating film, the second insulating film having a dielectric constant lower than a dielectric constant of the first insulating film;
 - 10 a first wiring pattern formed over the second insulating film; and
 - a conductive connection member buried in the second and first insulating films, the conductive connection member electrically interconnecting the first wiring pattern and the semiconductor element.
- 15 2. A semiconductor device according to claim 1, further comprising multilevel wiring patterns formed over the first wiring pattern, wherein the first wiring pattern and the multilevel wiring patterns are made of metal, and the first wiring pattern is disposed in a lowest level among wiring patterns made of metal.
- 20 3. A semiconductor device according to claim 1, wherein the second insulating film is made of organic insulating material or porous silica.
4. A semiconductor device according to claim 2, wherein the second insulating film is made of organic insulating material or porous silica.

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5. A semiconductor device according to claim 1, wherein:

a surface modifying layer formed by using silane coupler or metal coupler is formed on an upper surface of the second insulating film;

the semiconductor device further comprises a third insulating film
5 formed on the surface modifying layer and having a dielectric constant lower than the dielectric constant of the first insulating film; and

the first wiring pattern is buried in a trench whose bottom is defined by the surface modifying layer, the trench being formed in the third insulating film.

10 6. A semiconductor device according to claim 2, wherein:

a surface modifying layer formed by using silane coupler or metal coupler is formed on an upper surface of the second insulating film;

the semiconductor device further comprises a third insulating film
formed on the surface modifying layer and having a dielectric constant lower than
15 the dielectric constant of the first insulating film; and

the first wiring pattern is buried in a trench whose bottom is defined by the surface modifying layer, the trench being formed in the third insulating film.

7. A semiconductor device according to claim 3, wherein:

20 a surface modifying layer formed by using silane coupler or metal coupler is formed on an upper surface of the second insulating film;

the semiconductor device further comprises a third insulating film
formed on the surface modifying layer and having a dielectric constant lower than the dielectric constant of the first insulating film; and

25 the first wiring pattern is buried in a trench whose bottom is defined

by the surface modifying layer, the trench being formed in the third insulating film.

8. A semiconductor device comprising:

a semiconductor element formed over a surface of a semiconductor
5 substrate;

a protective film formed over the surface of the semiconductor
substrate, the protective film covering the semiconductor element;

a low dielectric constant film formed over the protective film, the low
dielectric constant film having a dielectric constant lower than a dielectric
10 constant of the protective film and made of porous silica or organic insulating
material;

a first wiring pattern formed over or above the low dielectric
constant film; and

a conductive connection member buried in the low dielectric
15 constant film and the protective film, the conductive connection member
electrically interconnecting the first wiring pattern and the semiconductor element.

9. A method of manufacturing a semiconductor device comprising steps of:

(a) forming a semiconductor element over a surface of a
20 semiconductor substrate;

(b) forming a protective film made of insulating material over the
surface of the semiconductor substrate by a vapor deposition method, the
protective film covering the semiconductor element;

(c) forming a first insulating film over the protective film by a coating
25 method, the first insulating film being made of insulating material having a lower

dielectric constant than the protective film;

(d) forming a via hole through the first insulating film and the protective film;

(e) burying a conductive plug in the via hole; and

5 (f) forming a metal wiring pattern over the first insulating film, the metal wiring pattern being connected to the conductive plug.

10. A method of manufacturing a semiconductor device according to claim 9, further comprising after the step (c):

10 a step of forming a second insulating film made of insulating material over the first insulating film by a vapor deposition method; and

a step of planarizing a surface of the second insulating film,

wherein in the step (d) the via hole is formed extending also through the second insulating film.

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